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EXAMINER

DOVE, TRACY MAE

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 07/31/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/743,962

Applicant(s)

KURISAWA, ISAMU

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10, 14, 15 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 14, 15 and 20-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6. 6) ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

This Office Action is in response to the communication filed on 6/6/03. Applicant's arguments have been considered, but are not persuasive. Claims 1-10, 14, 15 and 20-27 are pending. This Action is Non-Final.

#### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-15, in Paper No. 8 is acknowledged. Claims 16-19, drawn to a nonelected invention, have been canceled.

#### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 4/25/03 has been considered by the examiner.

#### ***Drawings***

The formal drawings were received on 8/24/01. These drawings are approved by the Examiner.

#### ***Claim Objections***

The objections to claims 5-15 have been withdrawn.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

#### ***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6 and 15 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Dasgupta et al., US 5,547,782.

Dasgupta teaches a lithium ion battery wherein corrosion of the current collector in contact with the electrode face is greatly reduced. An electrically conductive, ceramic layer is inserted between the current collector and the corresponding major face of the lithium ion battery. In an alternative embodiment, the metallic current collector plate is replaced by an electrically conductive laminated organic polymer having electrically conductive particles dispersed therein. The lithium ion battery includes a casing wherein the casing usually serves as the positive current collector and the metallic cover plate is usually the negative current collector. See abstract, col. 3, lines 17-23 and Figs 1 & 3-4. The corrosion protection layer (ceramic layer) is placed between the electrode (active material layer 4 in Fig. 1) and the metallic current collector (col. 4, lines 17-19). The ceramic layer may be produced by chemical vapor deposition (CVD), sputtering or flame or plasma spraying (col. 4, lines 55-63). The ceramic substance may be titanium nitride, zirconium nitride or any other ceramic material which is electrically conductive and may be obtained in the form of layers may also be used (col. 4, lines 33-39).

Thus the claims are anticipated.

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The claims are alternatively unpatentable because the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. Claim 1 contains the limitation “there is provided a structure such that a pressure of  $4 \times 10^4$  to  $20 \times 10^4$  Pa is maintained perpendicular to the surface of said collector”. This is a product-by-process limitation, thus, the limitation is considered obvious. Regardless of the pressure applied to the storage battery, the storage battery of the instant invention and the prior art are the same. Note the claimed pressure range includes standard atmospheric pressure of 1 atm ( $10 \times 10^4$  Pa). Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See also MPEP §2113.

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Claims 1-7, 10, 14 and 20-26 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Kao, Substrate materials for bipolar lead/acid batteries, Journal of Power Sources, 70 (1998).

Kao teaches a battery with a bipolar configuration is known to be advantageous over the conventional monopolar configuration in terms of power output. In a bipolar configuration, active materials of opposite polarities are placed on the two surfaces of a bipolar substrate. In a bipolar lead acid battery, the role of the substrate is paramount. The substrate serves as an intercell connection, as a support to active materials and provides a seal between individual cells

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(separator inherent between individual cells). The substrate must be electrically conductive and insoluble in sulfuric acid. Lead sheets are known substrate materials (see Introductions section page 8). Kao teaches different ceramic materials may be applied to a current collector (Table 1). Kao specifically discloses a laminated  $\text{SnO}_2$ /carbon plastic substrate (page 13, second to last line). Kao teaches ceramic materials such as  $\text{TiSi}_2$ ,  $\text{Ti}_5\text{Si}_3$ ,  $\text{NbSi}_2$ ,  $\text{TaSi}_2$  and  $\text{Ta}_5\text{Si}_3$  (Table 1) are known. The  $\text{SnO}_2$  is made conductive by dopants such as antimony and fluorine in the lattice structure (page 12).

Thus the claims are anticipated.

The claims are alternatively unpatentable because the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. Claim 1 contains the limitation “there is provided a structure such that a pressure of  $4 \times 10^4$  to  $20 \times 10^4$  Pa is maintained perpendicular to the surface of said collector”. This is a product-by-process limitation, thus, the limitation is considered obvious. Regardless of the pressure applied to the storage battery, the storage battery of the instant invention and the prior art are the same. Note the claimed pressure range includes standard atmospheric pressure of 1 atm ( $10 \times 10^4$  Pa). Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See also MPEP §2113.

Furthermore, whether the ceramic is applied by sputtering, CVD, spray coating or any other method of coating the substrate is used, the ceramic/substrate composite, as an end product, is the same.

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Claims 1-5, 14 and 20 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Bullock et al., US 5,045,170.

Bullock teaches a bipolar lead acid battery plate including an inorganic metal oxide additive which enhances the formation of the plate. The metal oxide may be a conductive ceramic (abstract). Figure 3 depicts a lead plate 32 (collector substrate) having ceramic layers 31 and active material layers 34. Layers 31 protect the underlying lead layer 32 from corrosion (col. 10, lines 31-32). A bipolar electrode includes a substrate and layers of positive and negative active material disposed on opposite sides of the substrate. The substrate contains the conductive ceramic as a filler (col. 4, lines 30-35).

Thus the claims are anticipated.

The claims are alternatively unpatentable because the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. Claim 1 contains the limitation "there is provided a structure such that a pressure of  $4 \times 10^4$  to  $20 \times 10^4$  Pa is maintained perpendicular to the surface of said collector". This is a product-by-process limitation, thus, the limitation is considered obvious. Regardless of the pressure applied to the storage battery, the storage battery of the instant invention and the prior art are the same. Note the claimed pressure range includes standard atmospheric pressure of 1 atm ( $10 \times 10^4$  Pa). Even though product-by-process claims are limited by and defined by the process, determination of patentability is based

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on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See also MPEP §2113.

Furthermore, whether the ceramic is applied by sputtering, CVD, spray coating or any other method of coating the substrate is used, the ceramic/substrate composite, as an end product, is the same.

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Claims 8, 9 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kao, Substrate materials for bipolar lead/acid batteries, Journal of Power Sources, 70 (1998).

See discussion of Kao above.

Kao does not explicitly state the mole percent of the dopant (antimony or fluorine) that is incorporated into the SnO<sub>2</sub> lattice structure.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because the courts have ruled where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. See MPEP 2144.05. Kao teaches SnO<sub>2</sub> doped with antimony or fluorine is known for use as a ceramic material formed on a current collector substrate. SnO<sub>2</sub> has a high oxygen overpotential but the stoichiometric SnO<sub>2</sub> crystal is not conductive. The conductivity of the SnO<sub>2</sub> comes from structural defects caused by low-valent Sn metal or dopants, such as antimony and fluorine in the lattice (page 12 of Kao). Thus one of



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skill would have been motivated to vary the dopant amount of the SnO<sub>2</sub> in order to achieve a desired balance between the conductivity of the doped SnO<sub>2</sub> ceramic material and the structural defects of the SnO<sub>2</sub> caused by the dopants..

***Response to Arguments***

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that the claimed pressure range provides "extremely superior effects which one skilled in the art cannot expect". However, forming the cell at standard atmospheric pressure is considered obvious. Constructing a battery at standard atmospheric pressure is not considered patentable subject matter.

Allowable subject matter was indicated in the previous Action, however, a further search of the prior art has produced a reference which teaches and/or suggests the previously allowed subject matter. Thus, the indication of allowable subject matter is withdrawn.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

Tracy Dove  
Patent Examiner  
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Art Unit 1745



1/03